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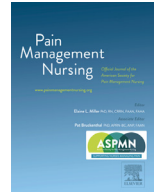
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## Quality Improvement

## Evaluation of the Use of Telehealth Video Visits for Veterans With Chronic Pain

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## ABSTRACT

**Background:** Telehealth video visits are essential for delivering timely care while mitigating exposure during the COVID-19 pandemic. Telehealth video visits have the potential to improve missed appointments, reduce costs associated with Veterans Affairs (VA) travel reimbursement, and lead to positive patient and provider satisfaction.

**Aims:** This evidence-based improvement project sought to evaluate whether telehealth visits reduce the occurrence of missed appointments, determine cost savings associated with the VA travel reimbursement and assess patient and provider satisfaction with telehealth video visits.

**Design:** Evidence-based improvement project.

**Setting:** A retrospective chart review was conducted on military veterans with chronic pain who completed a telehealth video visit in the VA San Diego (VASD) pain clinic.

**Methods:** Missed appointment rates were compared from before (April 1, 2019–October 1, 2019) to after (April 1, 2020–October 1, 2020) implementation of the telehealth video visits. Estimated travel reimbursement for qualified patients was calculated per VA policy. Electronic satisfaction surveys were administered to patients and nurse practitioners to assess satisfaction with telehealth video visits.

**Results:** There was an 82.5% reduction in missed appointments from pre to post implementation of telehealth video visits. There was an estimated cost savings in travel reimbursements of \$3,308.30. Overall, 93.62% of patients (n = 42) were satisfied with their video visits and there was a high degree of satisfaction in implementing video visits among the nurse practitioners (n = 3).

**Conclusions:** The use of telehealth video visits during the COVID-19 pandemic reduced missed appointments, exhibited cost savings in VA travel reimbursement, and led to positive patient and provider satisfaction.

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Chronic pain is detrimental to an individual's quality of life and is one of the most common reasons people seek medical care (Dahlhamer et al., 2018; St Sauver et al., 2013). Approximately 20% of the U.S. population are affected with chronic pain, and approximately 50% of U.S. military veterans regularly experience some type of chronic, persistent pain (Adams et al., 2021; Dahlhamer et al., 2018). When chronic pain is untreated or undertreated, deleterious effects, such as functional limitation, physical disability, and psychologic distress, can occur (Fine, 2011; Ratmansky et al., 2017). In many instances, patients experience negative emotions, such as anxiety and stress, which often trigger or worsen symptoms of pain (Lovo et al., 2019).

Missed medical appointments are one reason for undertreated chronic pain. Missed appointments, or “no-shows,” are defined as appointments where individuals fail to show up or cancel their appointment within 24 hours (Kheirkhah et al., 2015; Triemstra & Lowery, 2018). Before the COVID-19 outbreak, the initial intent for this evidence-based improvement project was to implement telehealth video visits to reduce the occurrence of missed appointments. The COVID-19 outbreak abruptly changed the focus of the project to mitigating exposure to the virus through limiting in-person medical appointments. To protect healthcare providers, medical staff, and patients, health care facilities, including the Veterans Affairs San Diego (VASD), implemented innovative solutions to remotely monitor patients with chronic pain.

The telehealth video visits generated interest from stakeholders throughout the VASD as almost all the specialty clinics, such as the pain clinic, took necessary steps to mitigate exposure to the virus.

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Soon after the Centers for Disease Control and Prevention (CDC) released its guidelines on imposing social distancing in March 2020, as well as the American College of Surgeons' recommendations on minimizing, cancelling, or postponing elective surgery, the Veterans Affairs (VA) focused on shifting patient care to a virtual/remote format when clinically appropriate (Bates, 2020; Diaz et al., 2020). In a very short time, the telehealth video visits were rapidly deployed at the VASD pain clinic.

Given the rapid deployment of video telehealth for use in comprehensive pain clinic, an evaluation was conducted to better understand whether the delivery of care in the remote format led to a reduction in missed clinic appointments, reduction in costs related to VA travel reimbursement, and patient and provider satisfaction. Importantly, this project will also inform how telehealth will continue to be delivered to patients with chronic pain following the COVID-19 pandemic.

### Available Knowledge

Video telehealth allows clinicians to directly provide healthcare services to patients (Finkelstein et al., 2020). Telehealth video visits expand access to chronic pain management by removing travel barriers associated with attending in-person visits (Eaton et al., 2014). Video visits offer an alternative to in-person visits when manual physical examination is not necessary but a scheduled or ad hoc visit with a clinician is desired (Finkelstein et al., 2020). A systematic review and meta-analysis was conducted by Dario et al. (2017) to address the effectiveness of video telehealth-based interventions in reducing pain and disability for people suffering from lower back pain. Although a few studies documented no significant impact of telehealth-based interventions on people with chronic low back pain, outcomes were favorable among adults with cardiovascular disease, diabetes, obesity, and osteoarthritis. The review identified the significant effects of telemedicine in enhancing the delivery of patient education and transmission of patient information using an electronic video device. In one of the three trials with <400 participants, using telehealth delivered remotely via electronic communications had a positive impact on pain, function, disability, and quality of life for participants with acute and subacute low back pain (Dario et al., 2017).

Multiple factors are associated with missed appointments including accessibility of specialized services and inability to travel due to impaired mobility, transportation issues, or financial hardship (Hwang et al., 2011; Odonkor et al., 2017; Ratmansky et al., 2017; Shaparin et al., 2014). Telehealth video visits enable patients to receive health care services without needing to travel to the nearest medical facility (Eaton et al., 2014; Finkelstein et al., 2020; Jacobs et al., 2019; Viers et al., 2015). According to two previous studies, telemedicine incurred lower costs, saved patients money on time and travel to appointments, and improved work attendance (Finkelstein et al., 2020; Viers et al., 2015). Additionally, Siwicki (2019) reported an overview of a 12-month project at Penn State Health using telemedicine video care to link patients with amyotrophic lateral sclerosis (ALS) to care teams. The authors reported a total distance savings of more than 8,780 miles after conducting 115 video visits. Furthermore, Dullet et al. (2017) found telemedicine resulted in a reduced travel distance of approximately 278 miles with a travel time savings of 245 minutes and a \$150 in travel cost savings for each provider consultation.

Previous research has underscored that telehealth video visits can lead to high patient satisfaction (Leach et al., 2016). A small randomized controlled trial with 55 male participants with a history of radical prostatectomy examined the efficiency, satisfaction, and costs for remote video visits relative to traditional office visits. The findings showed 88% of clinicians reported greater satisfac-

tion and effective communication among video visits (Viers et al., 2015). In this study, timeliness of care and patient satisfaction during telehealth video visits were relatively equivalent to in-person visits (Viers et al., 2015). A study by Voils et al. (2018) compared satisfaction rates with telehealth video and telephone visits. Providers preferred telehealth video over telephone due to their ability to read body language and ability to view patients' reactions. Participants in this study scored 25.2 mean satisfaction (out of 30) on telephone and 26.9 mean satisfaction (out of 30) scores on telehealth video.

### Rationale

Missed appointments are a major concern in outpatient clinics as they can lead to negative health outcomes. When a patient misses their pain clinic appointment, their pain symptoms remained untreated, placing them at a higher risk for further complications and functional impairment (Fine, 2011). Missed appointments can have significant negative impact on pain management and can lead to poor patient outcomes, increased emergency room visits, decreased practitioner productivity, and delayed medical care (Boos et al., 2016; Capko, 2007; Starnes et al., 2019). Premature all-cause mortality rates are substantially more prevalent among patients with repeated missed appointments, especially for patients with long-term mental health conditions (McQueenie et al., 2019).

Despite the relevance of telehealth in reducing missed appointments, only a handful of studies have examined the impact of video visits in reducing missed appointments for patients with chronic pain. Given the negative implications of missed appointments among patients with chronic pain, it is evident that exploring the implementation of telehealth video visits could provide clinicians a better understanding of its effect on missed appointments and the delivery of care.

### Specific Aims

The goal of this evidence-based improvement project was to complete a comprehensive evaluation of the use of telehealth video visits in an outpatient VA pain clinic. The specific project aims were to evaluate whether telehealth video visits reduce the occurrence of missed appointments in the pain clinic, evaluate cost savings associated with the VA travel reimbursement, and to assess patients' and providers' satisfaction with telehealth video visits.

### Methods

#### Context

This evidence-based improvement project took place in the Veterans Affairs Pain Medicine Clinic in San Diego, California. The VASD is a non-profit integrated healthcare system that provides comprehensive healthcare care services to more than 89,500 adult military veterans (Veterans Affairs, 2020). Each year, more than 9,000 patients are followed in the VASD pain clinic and about 2,000 new patients are enrolled yearly. The VASD pain clinic treats various pain conditions using a multimodal treatment approach.

Five pain management nurse practitioners are responsible for the delivery of telehealth service through video visits. More than 85% of clinic visits are with the nurse practitioners. Patients seen by the attending physicians are largely for interventional injections. Eligible patients who were enrolled in the nurse practitioners' telehealth video clinics between April 2020 and October 2020 were included. These patients were English-speaking adult military veterans ages 22-90 years, experiencing chronic pain, and who are

followed after receiving their pain injections and/or for medication management. The visits involved live video conferencing with the nurse practitioners via a secure, encrypted video teleconferencing platform exclusive to VA facilities. Exclusion factors included patients with severe medical conditions, including but not limited to cancer, heart failure, dialysis, and untreated psychiatric disorders, because these patients are closely monitored and require an in-person face-to-face physical examination with the pain attending physician.

### Interventions

Based on the patient's preference, the veterans were given the option to schedule their pain appointment via telehealth visits. The clinic administrative staff scheduled the patients who chose video-conferencing with pain providers. For Apple technology users, the VA Video Connect application was downloaded prior to the start of the scheduled patient-provider video conferencing. Windows and Android devices were used without installing any application. Once the video visit appointment was scheduled, the patient received an email notification. This email served as an appointment reminder, which included a hyperlink to join or be connected to the provider. Those who were scheduled for video visits in February and March 2021 were invited to complete an anonymous electronic survey. The survey was emailed to each patient with an option to choose to opt in or not to participate.

### Data Collection and Measures

A retrospective chart review was conducted by a pain management nurse practitioner using both the patient's electronic healthcare record and Veterans Health Information System and Technology Architecture (VISTA) application to create a dataset documenting patients' clinic attendance before implementation of telehealth video visits (April 2019 through October 2019) and after implementation (April 2020 through Oct 2020). In accordance with the Health Insurance Portability and Accountability Act of 1996, all information was de-identified. Only the appointment dates with the pain providers were recorded, and appointments with a clinical nurse were excluded. The number of telehealth video visits and estimated travel reimbursement for qualified patients was calculated by roundtrip travel distances between the patient's address and the main VASD.

The travel reimbursement applies to veterans with qualifying service-connected medical conditions, in low-income status, or receiving VA pensions. Veterans who qualified for this program receive reimbursement for their travel to a VA facility at 41.5 cents per mile. Travel distance is defined as the distance between the patient's zip code and the main Veteran Affairs medical facility using online Bing mapping (<https://www.bing.com/maps/directions>). The number of telehealth video visits and estimated travel reimbursement for qualified patients was calculated by round-trip travel distances between the patient address and the main VASD based on the shortest route. This determined travel savings or reduction in travel pay by using telehealth video visits.

Patient satisfaction with telehealth video visits was assessed using a modified electronic version of the Telepain patient satisfaction survey (Hanna et al., 2016). The survey questionnaire consists of 14 items, which are rated on a 5-point Likert Scale (1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree). Patients who completed a telehealth video visits between February 1, 2021 and March 30, 2021 were sent an emailed link to complete the patient satisfaction survey.

The nurse practitioners who were conducting telehealth video visits with patients were asked to provide their satisfaction with

telehealth video visits using a modified version of the University of Missouri telehealth provider satisfaction survey (Becevic et al., 2015). This survey contains 5 items assessed on a 5-point Likert scale (1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree). The pain management nurse practitioner asked the providers to complete the questionnaire in February 2021, reflecting provider satisfaction post implementation of telehealth visits.

### Analysis

Descriptive statistics (n, % and mean, SD) were used to summarize participant demographics. To evaluate whether telehealth video visits reduce the occurrence of missed appointments in the pain clinic, descriptive statistics were presented for the number of missed appointments monthly during pre and post implementation groups. A percent change calculation was computed to compare the average missed appointments at pre and post implementation. To evaluate cost savings associated with the VA travel reimbursement, the reimbursement cost for patients eligible for reimbursement who attended the post-implementation telehealth video visits were computed based on distance from facility at \$0.415 per mile. To assess patients' and providers' satisfaction with telehealth video visits, descriptive statistics (n, % and mean, SD) were presented for each item on satisfaction surveys. All statistical analyses were completed using IBM SPSS version 27, Armonk, NY: IBM Corp.

### Ethical Considerations

This quality improvement project has been formally evaluated using a quality improvement checklist and determined not to be human subjects research. This project did not collect any personal identifiable health information. Appropriate methods were used to achieve full de-identification of any information provided by the participants. Any VA employee or staff member not involved in the project were not allowed access to data collection and information. Statistical data collected from an electronic survey did not contain nor were any participants required to enter any private health information. All information obtained or gathered from the participants' survey questionnaires and data from retrospective chart reviews were protected under the Health Insurance Portability and Accountability Act of 1996.

### Results

The patients who were targeted for this project were seen in the pain clinic during the COVID-19 pandemic using telehealth video. A total of 1,493 patients were seen in the nurse practitioner's in-person pain clinic during the April 1, 2019, to October 1, 2019, pre-implementation period (pre COVID-19 pandemic). A total of 684 telehealth video visits were scheduled during the April 1, 2020, to October 1, 2020, post-implementation period (COVID-19 pandemic).

### Missed appointments

The missed appointment results pre and post implementation are presented in Table 1. The NP missed appointments were reduced from 143 to 25 (82.52% reduction).

There were 329 patients included in the cost savings calculation and 489 visits Table 2. presents information on number of telehealth visits for the 329 patients. Among the 329 patients, 213 patients (64.7%) had one video visit, 82 patients (24.9%) had two follow-up video visits, 25 patients (7.6%) had three follow-up video

**Table 1**  
Missed Appointment at Pre and Post Implementation

Provider Type	Pre-Implementation	Post-Implementation	% change
NP	1,493 visits/143 missed appointments	684 visits/25 missed appointments	- 82.52%

**Table 2**  
Number of Telehealth Video Visits (N = 329)

Number of Telehealth Video Visits	No. and Percent of Total	
	n	%
1	213	64.7
2	82	24.9
3	25	7.6
4	8	2.4
5	1	0.3

**Table 3**  
Demographic Characteristics of Survey Participants

Demographic characteristics	n	%
Sex, male <sup>a</sup>	39	84.8%
Ethnicity <sup>b</sup>		
American Indian	1	2.27
Asian/Pacific Islander	3	6.82
Black/African American	2	4.55
Hispanic	7	15.91
White/Caucasian	28	63.64
Age, years <sup>a</sup>		
25-34	1	2.17
35-44	7	15.22
45-54	9	19.57
55-64	13	28.26
65+	16	34.78
Education <sup>a</sup>		
High school degree or equivalent	3	6.52
Some college but no degree	17	36.96
Associate degree	10	21.74
Bachelor degree	11	23.91
Graduate Degree	5	10.87

<sup>a</sup> 46 responses.<sup>b</sup> 44 responses.

visits, 8 patients (2.4%) had four follow-up video visits, and one patient (0.3%) had five follow-up video visits.

#### Travel reimbursement cost savings

A total of 329 patients were eligible for beneficiary travel reimbursement. There were 7,971 miles of travel that were eliminated by telehealth video visits. This resulted in a total travel reimbursement savings of \$3,308.30. Established patients seen for recurrent chronic pain evaluation incurred lower costs when using telehealth visits compared to in-person office visits.

#### Patient & provider satisfaction

A total of 72 telehealth video visit surveys were distributed and 47 surveys were returned for a response rate of 65%. Demographics of respondents are presented in Table 3. In summary, the majority of respondents were aged >55 years, identified themselves as White, were male, and had some form of college education or college degree.

The perceptions of the telehealth video visits were positive (Table 4). Of all respondents, more than 80% felt that the telehealth visits were better than expected and would likely recommend this option to other patients. A highly positive response was reflected by 98% of patients in travel time, 96% expressed video visits were

convenient, 93% felt they developed friendly relationship with their providers during their video visits; 79% found no difference between telehealth video visits and in-person office appointments. Only 12.77% felt they would rather travel to see the provider in person instead of using telehealth video. Overall, 93.4% of patients were satisfied with their care using telehealth video visits.

Three nurse practitioners were surveyed; the responses are presented in Table 5. The nurse practitioners were satisfied with providing care through telehealth video visits to patients with chronic pain.

#### Discussion

Telehealth video visits have become an essential part of health care delivery, especially during the COVID-19 pandemic. At the beginning of the pandemic, all non-emergent in-person clinic visits were temporarily suspended and a majority of patient appointments were swiftly converted to telehealth video visits to reduce the risk of COVID-19 transmission. Patients were instructed to stay home, especially those at greater risk of contracting the disease. By utilizing telehealth technology, our clinic not only decreased patient exposure to COVID-19 but also continued to provide quality care and management of patients' pain.

Our evaluation of the implementation of telehealth video visits demonstrated 82.52% reduction in missed appointments in the pain clinic post implementation of the telehealth video visits. These results suggest that telehealth video visits reduced the occurrence of missed appointments in the pain clinic. Our findings are consistent with previous studies showing that telehealth video visits reduced missed appointments; however, our rates for improvement were much higher due to a larger patient volume scheduled in the pain clinic. For example, Drerup et al. (2021) showed fewer missed appointments with telehealth visits (186 scheduled telehealth visits with 14 missed appointments) than an in-person office visits (155 scheduled in-person office visits with 56 missed appointments), reflecting a 75% reduction of missed appointments. Additionally, Franciosi et al. (2021) observed significantly fewer missed appointments in their 2020 primary care and adult nonsurgical specialties telehealth visits compared to 2019 in-person clinic visits (12.4% versus 11.2%,  $p < .001$ , 12.9% versus 10.5%,  $p < .001$ ). However, missed appointments were statistically higher in the 2020 adult and pediatric surgical specialty telehealth visits than the 2019 in-person visits. However, the study by Gorodeski et al. (2020) showed no significant difference in no-show rate with telehealth visits when compared to the in-person visits in patients with heart failure transitioning to home after hospitalization.

#### Interpretation

Our analysis of 489 telehealth video visits that occurred between April 1, 2020, to October 1, 2020, accounted for approximately \$3,308.30 of travel reimbursement savings. A systematic literature review by Cabrera et al. (2020) evaluated the cost savings for patients utilizing telehealth. Of the 380 articles screened, eight studies identified patient-centered cost savings from using telehealth ranging from \$68 of travel cost per encounter to \$900 cumulative travel-related cost and work time lost per patient. In their



**Table 4**  
Patient Satisfaction with Telehealth Video Visit (n = 47)

Item	n "Agree" or "Strongly Agree"	%
My appointments by video are better than I expected	41	87.23%
I worried about my privacy <sup>a</sup>	6	12.77%
The care I received by video visit was just as good as with an in-person office appointment	37	78.72%
I was comfortable talking by video to the pain specialist	45	95.74%
The video visit saved me travel time	46	97.87%
The video visit saved me money	34	72.34%
I felt that everything was well covered during my visit <sup>b</sup>	43	93.48%
I would rather travel to have my next visit in-person than use the video visit	6	12.77%
I had difficulty hearing or seeing the doctor through the video	4	8.51%
I was able to develop a friendly relationship with my pain provider <sup>b</sup>	43	93.48%
I was able to explain my problems clearly to my doctor during the video visit	46	97.87%
The video visit was convenient	45	95.74%
Overall, I am satisfied with my video visit appointment	44	93.62%
I would recommend the video visit option to other patients	40	85.11%

<sup>a</sup> Negatively worded item so lower percentage indicates more satisfaction.

<sup>b</sup> 46 responses

**Table 5**  
Provider Satisfaction with Telehealth Video Visit (n = 3)

Item	% "Strongly Agree"	% "Agree"
I am able to treat my patients' needs well through telehealth video	66.67%	33.33%
I get more done in my day when I see patients through telehealth video <sup>a</sup>	66.67%	0.00%
It is easy to run and use the telehealth video system	66.67%	33.33%
I am confident and feel at ease when I use the telehealth video	66.67%	33.33%
For the most, I am satisfied with the work I've done through telehealth video visits	66.67%	33.33%

<sup>a</sup> Only 2 providers provided responses to this statement.

detailed review, telehealth visits demonstrated higher return on cost savings in other countries and in the Veterans Affairs Health-care System with commonly reported savings in travel cost reimbursement. On the contrary, one study showed telehealth visits to be more costly than in-person visits. Beyond this study, it is evident that the VA would potentially benefit from offering telehealth video visits as an alternative traditional in-person visits beyond the pandemic.

The results of our survey found patients overwhelmingly satisfied with their telehealth video visits. A high level of satisfaction was also touted by the three pain nurse practitioners surveyed. Showing similar findings, but with greater patient participation, Dobrusin et al. (2019) surveyed 1,492 patients in two community-based gastroenterology practices in Michigan. The study found more than 80% of patients were highly satisfied with their telehealth visits. Moreover, 77.3% of patients surveyed were more inclined to participate in future telehealth appointments. Concurrently, providers had similar levels of satisfaction. A total of 503 providers responded to the survey and over 90% were highly satisfied with telehealth services (strongly agree or agree).

In some instances, the provider converted the patients' telehealth video visits to telephone encounters due to inadequate video quality or patients' lack of understanding in troubleshooting their video technology. While telehealth video visits have many advantages, one disadvantage that we often encountered was the inability to physically examine patients presenting with new onset acute pain or exacerbation of chronic pain that was unresolved by current treatment.

It is likely that a novel infectious virus could emerge in the future for which stay-at-home orders would once again be implemented to slow the spread of the virus. The findings from this project demonstrate that telehealth can be used as an alternative

to in-person care for people in pain. Telehealth is also a long-term sustainable option for patients with higher probability of missed appointments or people who may have transportation challenges. The patients' and providers' receptivity to telehealth provides a positive outlook towards its role in the future. Overall, this project demonstrated a number of potential benefits for implementing telehealth video visits beyond the COVID-19 pandemic.

#### Limitations

This project has a few limitations that need to be considered. Although the survey is anonymous, the patient nonrespondents to the satisfaction survey (37%) may have had unpleasant experiences during their telehealth visits causing them to opt out of the survey to avoid disclosure. It is also possible that the nonrespondents preferred in-person visits over video visits. The high satisfaction rate may have been attributed to patients' proficiency in using videos when they may not have wanted to schedule an in-person visit due to risk of COVID-19 exposure. Additionally, not all VA patients are eligible to receive travel reimbursement. Patients who have a VA disability rating  $\geq 30\%$  are eligible to receive the travel reimbursement and those who earned above the "maximum annual VA pension rate" are ineligible (Veterans Affairs, n.d.). While we are able to identify the patients with a  $\geq 30\%$  service-connected disability rating, we were met with barriers in detecting the patients' annual VA pensions. Therefore, the actual travel reimbursement savings could potentially have been different than estimated.

#### Conclusions

In this evidence-based improvement project, offering telehealth video visits led to a significant reduction in the occurrence of

missed appointments, potential cost savings, and positive patient and provider satisfaction with using the telehealth video visits. This project provides insights on opportunities to improve access for patients requiring essential services during the COVID-19 pandemic and beyond.

### Declarations of Competing Interest

None.

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